

Recovery Plan Action Status

Plan Name: Chisos Mountain Hedgehog Cactus

Plan Status: Final

Plan Date: 08-Dec-93

Lead Agency: USFWS

Lead Office: Austin Ecological Services Field Office

(512)

490-0057)

Species	Action Priority #	Action #	Action Description	Action Status	Est. Initiation Date	Est. Completion Date	Responsible Parties	Work Type	Labor Type	Action Comments
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	111	Protect sites within Big Bend National Park	Ongoing Current	Prior to FY 1995		National Park Service	Management: Propagation	Internal Administrative	Off-road vehicle traffic is prohibited. Suspicious activity at sites is reported. Exotic plants have been controlled over much of the range.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	112	Conduct site evaluations and develop and implement short-term management plans	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Management	Internal Administrative	Management plan is evaluated and augmented annually; ES costs: FY1 = 2.5K, FY2 = 1K. NPS costs: FY1 = 2.5K, FY2 = 1K. TPWD costs: FY1=0.8K, FY2 = 0.3K.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	113	Develop and implement long-term management plans	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Management: Habitat Maintenance and Manipulation	Internal Administrative	Long-term management generally follows recovery plan; Starts after short-term plan. Necessary to tasks 6 and 8. ES costs = 2.5K, NPS costs = 2.5K, TPWD costs = 1K.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	114	Educate NPS staff about the presence and importance of the variety	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Other: Information and Education	Internal Administrative	Incorporated into annual volunteer and staff orientation; After program development, task would be incorporated into standard NPS training. ES costs = 2K/year, NPS costs = 2K/year.

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Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	12	Monitor populations	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Research: Population Surveys	Internal Administrative	Permanent monitoring plots (2) are measured annually; Necessary to 113, 13, 53, 54, 6 will be useful to tasks 322, 3231, 3233, 333, 313, 3141, 3143. ES costs = 1K/year, NPS costs = 4K/year, TPWD costs = 0.5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	13	Evaluate and revise management plans regularly	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Management: Planning	Internal Administrative	Short-term plan evaluated annually; Not needed until years 5 or 6.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	14	Ensure compliance with Federal and State laws and regulations	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, U.S. Fish and Wildlife Service, Law Enforcement Division, Texas Parks and Wildlife Department, USFWS Regional Office 2	Other: Law Enforcement	Internal Administrative	ES costs = 1K/year, LE costs = 1K/year, NPS costs = 1K/year, TPWD costs = 0.5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	15	Monitor cactus trade journals and collectors' publications and meetings	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, U.S. Fish and Wildlife Service, Law Enforcement Division, Texas Parks and Wildlife Department, USFWS Regional Office 2	Other	Internal Administrative	ES costs = 1K/year, LE costs = 1K/year, TPWD costs = 1K/year.

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Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	21	Establish germ bank/cultivated population with maximum genetic diversity	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Center for Plant Conservation, Texas Parks and Wildlife Department, USFWS Regional Office 2	Research: Taxonomic Studies	Internal Administrative	Seed bank established at Desert Botanical Garden. Conservation garden established at DBG and Sul Ross St. Univ.; Necessary to 111, 3212, 3233, 331, 332, 334, 52, 53, and 6. ES costs: FY1 = 3K, FY2 = 1.5K, FY3 = 0.75K. NPS costs: FY1 = 5K, FY2 = 2.5K, FY3 = 1.3K. TPWD costs = 0.5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	22	Establish a monitoring and management plan for cultivated and reserve material	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	Necessary to task 21. ES costs = 0.5K, NPS costs = 0.5K, TPWD costs = 0.5K.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	23	Coordinate cultivation program with research efforts	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Center for Plant Conservation, Texas Parks and Wildlife Department, USFWS Regional Office 2	Research: Propagation	Graduate Student	Coordinated between NPS, Desert Botanical Garden, and Angelo St. Univ.; Necessary to tasks 21, 53, and 6. Helpful to tasks 3213, 3232, 3233, 331, 333, and 334. ES costs = 0.5K/year, TPWD costs = 0.5K/year, NPS costs = 0.5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	24	Foster horticultural development of cultivated material to address commercial demand	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Center for Plant Conservation, USFWS Regional Office 2	Management: Propagation	Contract	ES costs = 0.5K/year, NPS costs = 1K/year.

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Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	3111	Study geology and hydrology	Complete	Prior to FY 1995	FY 2000 - FY 2004	U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Habitat Requirements	Species Expert	Micro-habitat and soil model completed (Crumpton 2002); Necessary to 113, 4, 53, and 6. ES costs = 1K/year, NPS costs = 8K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	3112	Study soils	Complete	Prior to FY 1995	FY 2000 - FY 2004	U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Soil Conservation Service, USFWS Regional Office 2	Research: Habitat Requirements	Species Expert	Micro-habitat and soil model completed (Crumpton 2002). Arroyo bench soils mapped as separate unit in 2006 NRCS soil map. Necessary to 113, 4, 53, and 6. ES costs = 0.5K, NPS costs = 5.5K, SCS costs = 1.8K.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	312	Study microclimate	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Habitat Requirements	Graduate Student, Species Expert	Necessary to 113, 4, 53, and 6. ES costs = 1K/year, NPS costs = 8K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	313	Study community structure	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Competition, Research: Population Surveys	Graduate Student	Angelo St. Univ. study 1999-current; Necessary to 113, 4, 52, and 6. ES costs = 1K/year, NPS costs = 11K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	3141	Study the status of the variety in the community	Unknown			U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Work type not yet selected	Labor type not yet selected	Necessary to 113, 51, 52, and 6. ES costs = 1K/year, NPS costs = 8K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	3142	Study the response to disturbance and past land management practices	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research, Research: Management Techniques	Contract	Necessary to 113, 4, 51, 52, and 6. ES costs = 1K/year. NPS costs = 5K/year.

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Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	3143	Study interactions with other species	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Competition, Research: Demographic Studies	Graduate Student	Angelo St. Univ.; Necessary to 113, 51, 52, and 6. ES costs = 1K/year, NPS costs = 8K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	3144	Study cyclic and dynamic processes	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Demographic Studies	Graduate Student	Angelo St. Univ.; Necessary to 113, helpful to 51, 52, and 6. ES costs = 0.5K/year, NPS costs = 1.5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	3211	Assess present demographic conditions and evaluate requirements for stability	Ongoing Current	FY 1995 - FY 1999		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Demographic Studies, Research: Population Surveys	Internal Administrative, Internal Field Assistance, Volunteer	Annual monitoring data have been collected for 10 years. Stability analysis needs to be performed. Necessary to 113, 12, 3213, 52, 53, 6, and 8. ES costs = 1K/year, NPS costs = 5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	3212	Assess genetic viability and evaluate requirements for stability	Discontinued	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Genetics, Research: Other Information	Graduate Student	Started by Angelo St. Univ. but suspended due to lack of funding; Necessary to 113, 21, 52, 53, 6, and 8. ES costs = 1K/year, NPS costs = 11K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	322	Characterize phenology and identify vulnerable stages of life cycle	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Demographic Studies, Research: Other Information	Graduate Student	Angelo St. Univ.; Necessary to 113, 12, 21, 24, 13, 3142, 3143, 51, 52, 53, 6, and 8. ES costs = 1K/year, NPS costs = 5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	3231	Determine types of reproduction and contribution to population	Complete	Prior to FY 1995	FY 2000 - FY 2004	U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Other Information, Research: Population Surveys, Research: Propagation	Graduate Student	Angelo St. Univ., repro. is sexual only; Necessary to 113, 12, 14, 3213, 51, 52, 53, and 6. ES costs = 1K/year, NPS costs = 8K/year.

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Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	3232	Study pollination biology	Partially Complete	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Propagation	Graduate Student	Angelo St. Univ. 1999-2003 studies, but still some questions on self-compatibility, species may be pollinator limited; Necessary to 113, 12, 3213, 51, 52, 53, and 6. ES costs = 1K/year, NPS costs = 8K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	3233	Study seed production, viability, and dispersal	Complete	Prior to FY 1995	FY 2000 - FY 2004	U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Propagation	Graduate Student	Angelo St. Univ. high seed production, viability variable; Necessary to 113, 12, 24, 3213, 51, 52, 53 and 6. ES costs = 1K/year, NPS costs = 8K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	3234	Study seedling recruitment	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Propagation	Internal Administrative, Internal Field Assistance, Volunteer	annual monitoring indicates recruitment has been steady, though episodic; Necessary to 113, 12, 21, 24, 3213, 51, 52, 53, 6, and 8. ES costs = 1K/year, NPS costs = 8K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	331	Study seed biology	Unknown			National Park Service	Research	Contract	Necessary to 21, 24, 51, 52, 53, and 6. All costs are NPS.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	332	Study germination requirements	Ongoing Current	Prior to FY 1995		National Park Service	Research: Propagation	Species Expert	Desert Botanical Garden; Necessary to 113, 21, 24, 51, 52, 53, and 6. All costs are NPS.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	333	Study seedling biology	Ongoing Current	Prior to FY 1995		National Park Service	Research: Propagation	Species Expert	Desert Botanical Garden; Necessary to 113, 12, 21, 24, 51, 52, 53, and 6. All costs are NPS.

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Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	334	Investigate propagation techniques	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, USFWS Regional Office 2	Research: Propagation	Species Expert	Desert Botanical Garden; Necessary to tasks 24, 52, 53 and 6. ES costs = 0.5K/year, NPS costs = 3.5K/year. Desert Botanical Garden work ongoing.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	4	Search areas with potential habitat for additional populations and potential reintroduction sites	Partially Complete	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, Mexico, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Research: Reintroduction	Internal Administrative, Internal Field Assistance, Volunteer	Site analysis completed in 2004, trial reestablishment started in 2004, monitored twice a year; Necessary to tasks 51, 53, and 6. ES costs = 2.5K/year, NPS costs = 2K/year, TPWD costs = 1.5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	2	51	Assess ability of the present habitat to support the variety and evaluate the need for habitat restoration	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Research: Habitat Requirements, Research: Habitat Status	Internal Administrative, Internal Field Assistance, Volunteer	Exotic annual plants identified as major habitat threat, exotic plant management ongoing; Depends on outcome of task 3. ES costs = 1.5K/year, NPS costs = 1K/year, TPWD costs = 0.5K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	3	52	Examine reintroduction techniques available	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Research: Reintroduction	Graduate Student, Internal Administrative, Species Expert	Angelo St. Univ., Desert Botanical Garden, NPS; Needed for task 53 and 6. ES costs = 1.5K, NPS costs = 2K, TPWD costs = 0.5K.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	3	53	Establish pilot program for reintroduction	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Research: Reintroduction	Labor type not yet selected	Needed for task 6. ES costs: FY1 = 1K, FY2&3 = 0.5K/year. NPS costs: FY1 = 7K, FY2&3 = 2K/year. TPWD costs: FY1 = 0.5K.

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Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	3	54	Assess feasibility of reintroduction program	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Work type not yet selected	Internal Administrative, Internal Field Assistance, Volunteer	Follows completion of task 53.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	3	6	Develop and implement a reintroduction plan, if feasible	Ongoing Current	FY 2000 - FY 2004		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Other	Internal Administrative	Depends on outcome of task 5.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	1	71	Develop an effective campaign to make collection or possession of field dug plants of Echinocereus chisoensis var. chisoensis unacceptable	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Other: Information and Education	Internal Administrative	Should be closely coordinated with task 24. ES costs = 5K/year, NPS costs = 5K/year, TPWD costs = 2K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	3	72	Educate the public about Echinocereus chisoensis var. chisoensis	Ongoing Current	Prior to FY 1995		U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Other: Information and Education	Internal Administrative, Internal Technical Assistance, Volunteer	ES costs: FY1 = 3K, FY2&3 = 1K/year. NPS costs: FY1 = 2K, FY2&3 = 1K/year. TPWD costs = 1K/year.
Chisos Mountain hedgehog Cactus (Echinocereus chisoensis var. chisoensis)	3	8	Develop a post-recovery monitoring plan	Not Started			U.S. Fish and Wildlife Service, Ecological Services Division, National Park Service, Texas Parks and Wildlife Department, USFWS Regional Office 2	Other	Internal Administrative, Species Expert	